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P30416.A03 Application No. 10/588,286

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Yasukata DEKISHIMA et al. Group Art Unit: 1632

Appln. No. : 10/588,286 Examiner: Unassigned
(U.S. National Stage entry of PCT/JP05/02093)

I.A. Filed : February 4, 2005 **Confirmation No.: 6444**

For : METHOD FOR PRODUCING ALCOHOL AND CARBOXYLIC ACID HAVING OPTICAL ACTIVITY

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
U.S. Patent and Trademark Office
Customer Service Window, Mail Stop **Amendment**
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Sir:

Pursuant to 37 C.F.R. § 1.56 and 37 C.F.R. §§ 1.97-1.98, Applicants hereby direct the Examiner's attention to the following information, which includes documents cited in the International Search Report, the International Preliminary Report on Patentability, and the Written Opinion for International Application No. PCT/JP05/02093, of which the above-referenced application is a National Stage:

(1) S. XIE et al., "NAD^+-Dependent (S)-Specific Secondary Alcohol Dehydrogenase Involved in Stereoinversion of 3-Pentyn-2-ol Catalyzed by *Nocardia fusca* AKU 2123", Biosci. Biotechnol. Biochem., Vol. 63, No. 10, pp. 1721-1729 (1999);

(2) H. GROGER et al., "Preparative Asymmetric Reduction of Ketones in a Biphasic Medium with an (S)-Alcohol Dehydrogenase under in Situ-Cofactor-Recycling with a Formate Dehydrogenase", Tetrahedron, Vol. 60, No. 3, pp. 633-640 (2004);

(3) W. HUMMEL et al., "Towards a Large-Scale Asymmetric Reduction Process with Isolated Enzymes: Expression of an (S)-Alcohol Dehydrogenase in E. coli and Studies on the Synthetic Potential of this Biocatalyst", Adv. Synth. Catal., Vol. 345, Nos. 1 and 2, pp. 153-159 (2003);

(4) JP 2005-6552 A, January 13, 2005, accompanied by an English language abstract provided by esp@cenet;

(5) JP 2005-2 A, January 6, 2005, accompanied by an English language abstract provided by esp@cenet

(6) U.S. Patent No. 7,083,962 B2 (KIMOTO et al.), issued August 1, 2006; Applicants note that this document is identified by esp@cenet as a U.S. family member of document (5).

Furthermore, Applicants direct the Examiner's attention to the following documents cited and discussed in the specification of the present application:

(7) A. SCHMITZER et al., "Reactivity at the Interface of Chiral Amphiphilic Dendrimers. High Asymmetric Reduction by $NaBH_4$ of Various Prochiral Ketones", J. Am. Chem. Soc., Vol. 123, pp. 5956-5961 (2001); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 1, last paragraph;

(8) JP 11-240894 A, September 7, 1999, accompanied by an English language abstract provided by Patent Abstracts of Japan; Applicants note that this document is cited and discussed in the specification of the present application beginning at page 1, last paragraph;

(9) JP 10-4998 A, January 13, 1998, accompanied by an English language abstract provided by Patent Abstracts of Japan; Applicants note that this document is cited and discussed in the specification of the present application beginning at page 2, line 5;

(10) K. NAKAMURA et al., "Recent Developments in Asymmetric Reduction of Ketones with Biocatalysts", Tetrahedron: Asymmetry, Vol.14, pp. 2659-2681 (2003); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 2, line 11;

(11) WO 00/24358 A1, May 4, 2000; Applicants note that this document is cited and discussed in the specification of the present application beginning at page 2, line 23;

(12) JP 62-265279 A, November 18, 1987, accompanied by an English language abstract provided by Patent Abstracts of Japan; Applicants note that this document is cited and discussed in the specification of the present application beginning at page 2, last line;

(13) U.S. Patent No. 4,775,692 (OHNO et al.), issued October 4, 1988; Applicants note that this document is identified by esp@cenet as a U.S. family member of document (12);

(14) J. CASON et al., "Branched-Chain Fatty Acids. XVI. Synthesis of the Optical Isomers of 15-Methyloctadecanoic Acid", J.Am.Chem.Soc., Vol. 72, pp. 4695-4697; Applicants note that this document is cited and discussed in the specification of the present application beginning at page 3, line 2;

(15) J. MALTHÊTE et al., "Reentrant Cholesteric Phase in Pure Compounds", Nouveau Journal de Chimie, Vol. 9, pp. 557-560 (1985); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 3, line 11;

(16) W. THOMPSON et al., "3'-Tetrahydrofuranylglycine as a Novel, Unnatural Amino Acid Surrogate for Asparagine in the Design of Inhibitors of the HIV Protease", J. Am. Chem. Soc., Vol. 115, pp. 801-803 (1993); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 3, line 10;

(17) T. OKANO et al., "Synthesis of Optically Active Trifluoromethylated Indolizidine Derivatives via Stereoselective Radical Cyclization", Organic Letters, Vol. 4, No. 9, pp. 1571-1573 (2002); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 3, line 19;

(18) P. CONFALONE et al., "Intramolecular [3+2] Cycloaddition Routes to Carbon-Bridged Dibenzocycloheptanes and Dibenzazepines", J. Org. Chem., Vol. 48, pp. 2994-2997 (1983); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 3, line 26;

(19) A. ALEXAKIS et al., "Asymmetric Conjugate Addition to Alkylidene Malonates", Tetrahedron: *Asymmetry,* Vol. 12, pp. 1151-1157 (2001); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 4, line 14;

(20) W. OPPOLZER et al., "25. Camphorsulfonamide-Shielded, Asymmetric 1,4-Additions and Enolate Alkylations; Synthesis of a Southern Corn Rootworm Pheromone", Helvetica Chimica Acta, Vol. 68, pp. 212-215 (1985); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 4, line 20;

(21) U.S. Patent No. 5,136,020 (MURTIASHAW), issued August 4, 1992; Applicants note that this document is cited and discussed in the specification of the present application beginning at page 5, line 4;

(22) K. MORI, "Absolute Configuration of (-)-4-Methylheptan-3-ol, a Pheromone of the Smaller European Elm Bark Beetle, as Determined by the Synthesis of its (3R,4R)-(+)- and (3S,4R)-(+)-Isomers", Tetrahedron, Vol. 33, pp. 289-294 (1977); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 5, line 4;

(23) R. HILL et al., "Stereospecificity of Enzymatic Dehydrogenation during Tiglate Biosynthesis", J. Am. Chem. Soc., Vol. 102, pp. 7344-7348 (1980); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 5, line 18;

(24) M. ZOLLER et al., "Oligonucleotide-directed Mutagenesis using M13-derived Vectors: an Efficient and General Procedure for the Production of Point Mutations in any Fragment of DNA", Nucleic Acids Research, Vol. 10, No. 20, pp. 6487-6500 (1982); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 23, line 15;

(25) A. DIAMOND et al., "Methods of RNA Sequence Analysis", Methods in Enzymology, Vol. 100, pp. 431-453 (1983); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 23, line 15;

(26) T. CLACKSON et al., "General Applications of PCR to Gene Cloning and Manipulation", Molecular Cloning, PCR-A Practical Approach, IRL Press, pp. 187-214 (1991); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 23, line 16;

(27) J. REISER et al., "Transfer and Expression of Heterologous Genes in Yeasts Other than *Saccharomyces cerevisiae*", Advances in Biochemical Engineering and Biotechnology, Vol. 43, pp. 75-102 (1990); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 25, line 15;

(28) M. ROMANOS et al., "Foreign Gene Expression in Yeast: a Review", Yeast, Vol. 8, pp. 423-488 (1992); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 25, line 15;

(29) M. BAGDASARIAN et al., "Activity of the Hybrid trp-lac(tac) Promoter of *Escherichia coli* in *Pseudomonas putida*. Construction of Broad-Host-Range, Controlled-Expression Vectors", Gene, Vol. 26, pp. 273-282 (1983); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 27, line 4;

(30) K. MIWA et al., "Construction of Novel Shuttle Vectors and a Cosmid Vector for the Glutamic Acid-Producing Bacteria *Brevibacterium lactofermentum* and *Corynebacterium glutamicum*", Gene, Vol. 39, pp. 281-286 (1985); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 27, line 6;

(31) JP 57-183799 A, November 12, 1982, accompanied by an English language abstract provided by Patent Abstract of Japan; Applicants note that this document is cited and discussed in the specification of the present application beginning at page 27, line 11;

(32) U.S. Patent No. 4,500,640 (KATSUMATA et al.), issued February 19, 1985; Applicants note that this document is identified by esp@cenet as a U.S. family member of document (31);

(33) A. OZAKI et al., "Functional Expression of the Genes of Escherichia coli in Gram-Positive *Corynebacterium glutamicum*", Mol. Gen. Genet., Vol. 196, pp. 175-178 (1984); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 27, line 11;

(34) W.-D. HEYER et al., "Replicating Plasmids in *Schizosaccharomyces pombe*: Improvement of Symmetric Segregation by a New Genetic Element", Molecular and Cellular Biology, Vol. 6, No. 1, pp. 80-89 (1986); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 27; line 19;

(35) G SAUNDERS et al., "Heterologous Gene Expression in Filamentous Fungi", Trends in Biotechnology, Vol. 7, pp. 283-287 (1989); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 27, line 25; and

(36) S. MAEDA et al., "Production of Human α-Interferon in Silkworm Using a Baculovirus Vector", Nature, Vol. 315, pp. 592-594 (1985); Applicants note that this document is cited and discussed in the specification of the present application beginning at page 28, line 4.

Copies of the above-listed documents (with the exception of the U.S. Patents), the International Search Report (in English and Japanese), the International Preliminary Report on Patentability, and the Written Opinion (in English and Japanese) for International Application No. PCT/JP05/02093 are enclosed together with a completed copy of the PTO-1449 Form listing these documents. Accordingly, the Examiner is requested to consider these documents and to indicate such consideration by returning a signed and initialed copy of the PTO-1449 Form with the next official communication.

Further to the U.S. Patent and Trademark Office's decision to partially waive the requirements under 37 C.F.R. § 1.98 (a)(2)(i) and (iii), copies of the U.S. Patents cited above are not enclosed herewith. However, if any copies are needed, the Examiner is respectfully requested to contact the undersigned.

Applicant notes that an Office Action on the merits has not yet issued in the instant application, and thus, no fee is necessary to ensure consideration of this statement. However, if an Office Action has issued and is crossing in the mail with this statement, the Patent and Trademark Office is hereby authorized to charge Deposit Account No. 19-0089 any fee necessary to ensure consideration of the submitted materials.

If there should be any questions, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,
Yasukata DEKISHIMA et al.

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FORM PTO-1449 U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. P31416	Application No. 108588,286
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	Applicant Yasukata DEKISHIMA et al.	
	Filing Date February 4, 2005	Group 1632

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	NO

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

	1	S. XIE et al., "NAD$^+$-Dependent (S)-Specific Secondary Alcohol Dehydrogenase Involved in Stereoinversion of 3-Pentyn-2-ol Catalyzed by *Nocardia fusca* AKU 2123", Biosci. Biotechnol. Biochem., Vol. 63, No. 10, pp. 1721-1729 (1999).
	2	H. GROGER et al., "Preparative Asymmetric Reduction of Ketones in a Biphasic Medium with an (S)-Alcohol Dehydrogenase under in Situ-Cofactor-Recycling with a Formate Dehydrogenase", Tetrahedron, Vol. 60, No. 3, pp. 633-640 (2004).
	3	W. HUMMEL et al., "Towards a Large-Scale Asymmetric Reduction Process with Isolated Enzymes: Expression of an (S)-Alcohol Dehydrogenase in E. coli and Studies on the Synthetic Potential of this Biocatalyst", Adv. Synth. Catal., Vol. 345, Nos. 1 and 2, pp. 153-159 (2003).
	4	A. SCHMITZER et al., "Reactivity at the Interface of Chiral Amphiphilic Dendrimers. High Asymmetric Reduction by $NaBH_4$ of Various Prochiral Ketones", J. Am. Chem. Soc., Vol. 123, pp. 5956-5961 (2001).
	5	K. NAKAMURA et al., "Recent Developments in Asymmetric Reduction of Ketones with Biocatalysts", Tetrahedron: Asymmetry, Vol.14, pp. 2659-2681 (2003).
	6	J. CASON et al., "Branched-Chain Fatty Acids. XVI. Synthesis of the Optical Isomers of 15-Methyloctadecanoic Acid", J.Am.Chem.Soc., Vol. 72, pp. 4695-4697.
	7	J. MALTHÊTE et al., "Reentrant Cholesteric Phase in Pure Compounds", Nouveau Journal de Chimie, Vol. 9, pp. 557-560 (1985).
	8	W. THOMPSON et al., "3'-Tetrahydrofuranylglycine as a Novel, Unnatural Amino Acid Surrogate for Asparagine in the Design of Inhibitors of the HIV Protease", J. Am. Chem. Soc., Vol. 115, pp. 801-803 (1993).
	9	T. OKANO et al., "Synthesis of Optically Active Trifluoromethylated Indolizidine Derivatives via Stereoselective Radical Cyclization", Organic Letters, Vol. 4, No. 9, pp. 1571-1573 (2002).
	10	P. CONFALONE et al., "Intramolecular [3+2] Cycloaddition Routes to Carbon-Bridged Dibenzocycloheptanes and Dibenzazepines", J. Org. Chem., Vol. 48, pp. 2994-2997 (1983);
	11	A. ALEXAKIS et al., "Asymmetric Conjugate Addition to Alkylidene Malonates", Tetrahedron: *Asymmetry,* Vol. 12, pp. 1151-1157 (2001).
	12	W. OPPOLZER et al., "25. Camphorsulfonamide-Shielded, Asymmetric 1,4-Additions and Enolate Alkylations; Synthesis of a Southern Corn Rootworm Pheromone", Helvetica Chimica Acta, Vol. 68, pp. 212-215 (1985).
	13	K. MORI, "Absolute Configuration of (-)-4-Methylheptan-3-ol, a Pheromone of the Smaller European Elm Bark Beetle, as Determined by the Synthesis of its (3R,4R)-(+)- and (3S,4R)-(+)-Isomers", Tetrahedron, Vol. 33, pp. 289-294 (1977).

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	14	R. HILL et al., "Stereospecificity of Enzymatic Dehydrogenation during Tiglate Biosynthesis", J. Am. Chem. Soc., Vol. 102, pp. 7344-7348 (1980).
	15	M. ZOLLER et al., "Oligonucleotide-directed Mutagenesis using M13-derived Vectors: an Efficient and General Procedure for the Production of Point Mutations in any Fragment of DNA", Nucleic Acids Research, Vol. 10, No. 20, pp. 6487-6500 (1982).
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	21	K. MIWA et al., "Construction of Novel Shuttle Vectors and a Cosmid Vector for the Glutamic Acid-Producing Bacteria *Brevibacterium lactofermentum* and *Corynebacterium glutamicum*", Gene, Vol. 39, pp. 281-286 (1985).
	22	A. OZAKI et al., "Functional Expression of the Genes of Escherichia coli in Gram-Positive *Corynebacterium glutamicum*", Mol. Gen. Genet., Vol. 196, pp. 175-178 (1984).
	23	W.-D. HEYER et al., "Replicating Plasmids in *Schizosaccharomyces pombe*: Improvement of Symmetric Segregation by a New Genetic Element", Molecular and Cellular Biology, Vol. 6, No. 1, pp. 80-89 (1986).
	24	G SAUNDERS et al., "Heterologous Gene Expression in Filamentous Fungi", Trends in Biotechnology, Vol. 7, pp. 283-287 (1989).
	25	S. MAEDA et al., "Production of Human α-Interferon in Silkworm Using a Baculovirus Vector", Nature, Vol. 315, pp. 592-594 (1985).
	26	English language abstract of JP 2005-6552.
	27	English language abstract of JP 2005-02 A.
	28	English language abstract of JP 11-240894.

EXAMINER	DATE CONSIDERED

*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO-1449 U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. P31416	Application No. 108588,286
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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		7 0 8 3 9 6 2	08/01/06	KIMOTO et al.			
		4 7 7 5 6 9 2	10/04/88	OHNO et al.			
		5 1 3 6 0 2 0	08/04/92	MURTIASHAW			
		4 5 0 0 6 4 0	02/19/85	KATSUMATA et al.			

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO
	2005	- 6 5 5 2	01/13/05	JAPAN				
	2005	- 2	01/06/05	JAPAN				
	11	- 2 4 0 8 9 4	09/07/99	JAPAN				
	10	- 4 9 9 8	0113/98	JAPAN				
	00	/ 2 4 3 5 8	05/04/00	W.I.P.O				
	62	- 2 6 5 2 7 9	11/18/87	JAPAN				
	57	- 1 8 3 7 9 9	11/12/82	JAPAN				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

	29	English language abstract of JP 11-4898.
	30	English language abstract of JP 62-265279.
	31	English language abstract of JP 57-183799.

EXAMINER	DATE CONSIDERED

*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.